

How happy should I be if the news were conveyed to me, that the man who is the ringleader of this diabolical scheme had himself fallen beneath the vengeance of a lion or a crocodile.

Even if there were sufficient proof that the sleeping sickness is propagated by the large mammals and reptiles, there are many other means of checking it besides the extermination of these animals. The increase of various birds should be encouraged which devour the flies which propagate the disease, and every other means should be taken of a reasonable character.

Although I recognise the undisputed fact that the wild species of Africa must be kept in due bounds in the more thickly populated districts, I am convinced that every State of that vast continent, should never cease to preserve a sufficient number of all the indigenous local species, and that in the near vicinity of all the principal towns national parks should be established for the preservation of these wonderful forms of life; so that future generations may not be deprived of the pleasure of beholding them.

RALPH DE TUNSTALL SNEYD.

Fairview, Leek, Staffs, September 8.

Instincts that are not Inherited Memories.

If, as is not improbable, the presidential address to the British Association has the effect of reviving the dying embers of the use-inheritance discussion, it may not be out of place at this juncture to direct attention again to the fact that it is impossible to regard some of the instincts of insects as inherited memories.

Not only do the instincts of the neuters among the social Hymenoptera stand like a "lion in the path," but there are the less prominent but equally important section of instincts connected with oviposition, where, as in the case of some spiders, the female protects her eggs after deposition, with no possibility of the action being transmitted to the offspring so protected.

A bug, *Tectocoris lineola*, var. *banksi* (Don.), is recorded by Mr. Frederick F. Dodd (Transactions of the Entomological Society, 1904, pp. 483-5) as protecting its egg patch, laid on twigs of its food plant, by standing over them for a period of three weeks.

Females of some species of Psychid moths block the entrance of the larval case, which serves both as a puparium and place to deposit the eggs, with their bodies after depositing their ova.¹ Various species of Hymenoptera carefully block the entrance to the burrows where their eggs are laid, &c.

A. BACOT.

154 Lower Clapton Road, N.E., September 8.

Meteors and the Comet.

SEPTEMBER 13, 8h. 32m., mag. 1, rapid, streak, $343^{\circ}+26^{\circ}$ to $332\frac{1}{2}^{\circ}+12^{\circ}$. Radiant, $71^{\circ}+52^{\circ}$.

September 14, 9h. 19m., mag. 1, slowish, yellow, $336^{\circ}+38^{\circ}$ to $330\frac{1}{2}^{\circ}+48^{\circ}$. Radiant, $343^{\circ}+24^{\circ}$ or $347^{\circ}+15^{\circ}$.

On September 14, at 9 p.m., the comet was seen at Bristol in a 2-inch field-glass just north of 50 Cassiopeiæ as a misty patch, perhaps about equivalent to an eighth-magnitude star.

W. F. DENNING.

Bristol.

Meteors.

THE observation of meteors forms one of the most attractive branches of astronomy. No instruments are needed. The observer only requires patience, a pretty good eye, and experience, which, of course, must be learned.

Meteors fall on every night of the year. The sky may be lit with the moon, it may be murky, it may be cloudy, but still there are the meteors going on unceasingly. For every one seen by human eyes there are no doubt thousands, probably tens of thousands, unseen. Yet this branch, involving as it does star-gazing pure and simple, is a most attractive one, and in the bright years of the future it will no doubt occupy a very prominent place.

Bristol.

W. F. DENNING.

¹ "Brit. Lepidoptera," Tutt, vol. ii., p. 367.

SURVEYING FOR ARCHÆOLOGISTS.¹

III.

Instruments for the Measurement of Magnetic Azimuth alone.

THE most inefficient instrument to employ in measuring magnetic bearings is the ordinary mariner's compass, showing the compass points only.

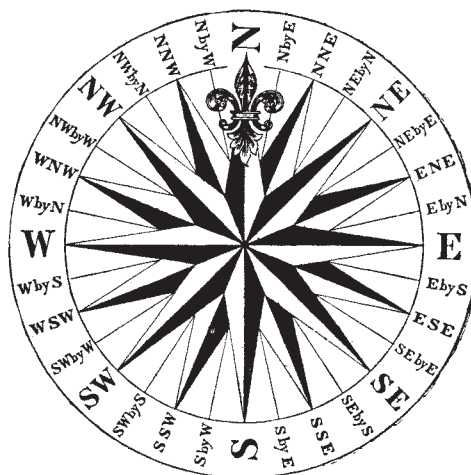


FIG. 7.—The "points" of the mariner's compass.

But there are now mariner's compasses available in which the bearings are stated in degrees, and in many ways, the degrees running from N. and S. to E. and W., and so on. The best form of card, however, is represented in Fig. 8, in which the degrees run from N. through E., S., W. to N. again.

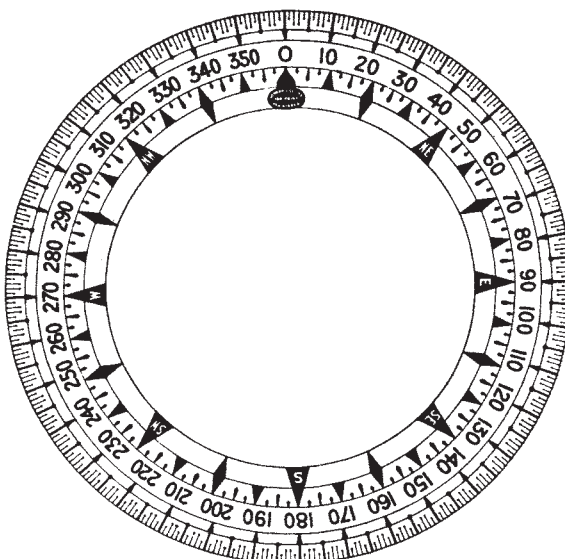


FIG. 8.—Compass with the circle of the horizon divided into 360 degrees, the N. point being 0°.

The magnetic bearings thus obtained should at once be changed into true bearings; this can be done approximately by reference to the appended maps, which bring together the recent results obtained by the Ad-

¹ Continued from p. 445.

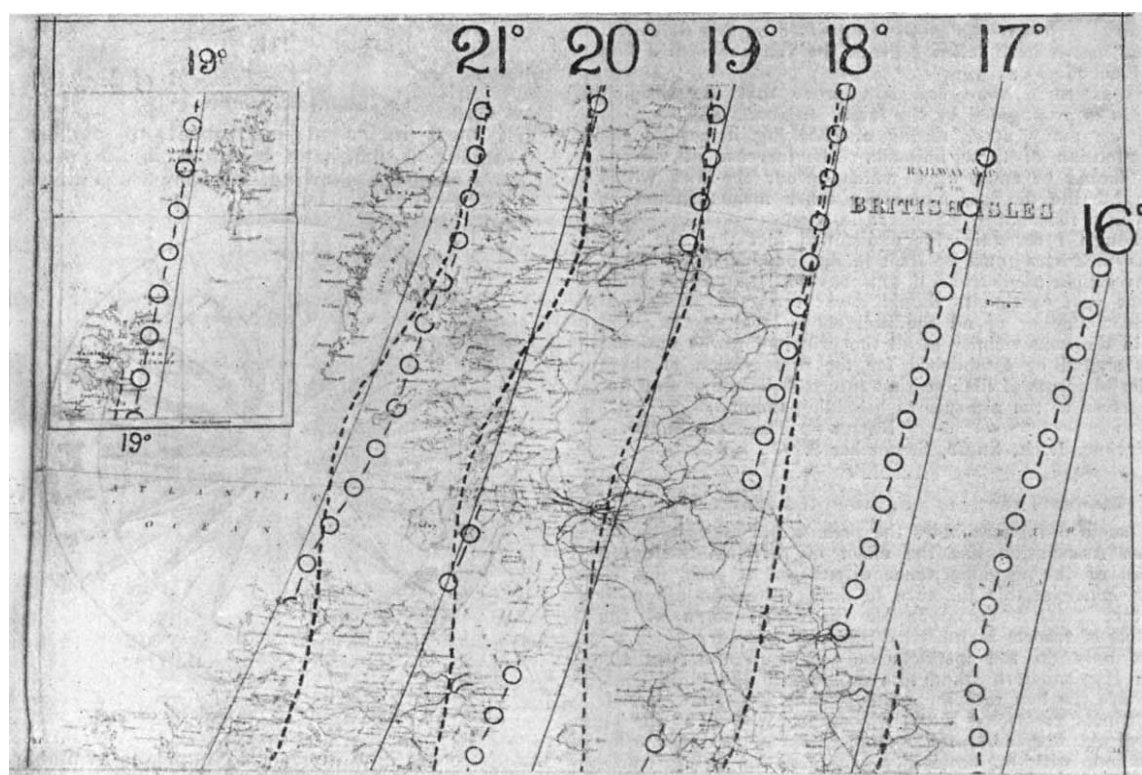


FIG. 9.—The western magnetic variation in N. Britain and N. Ireland in 1907.

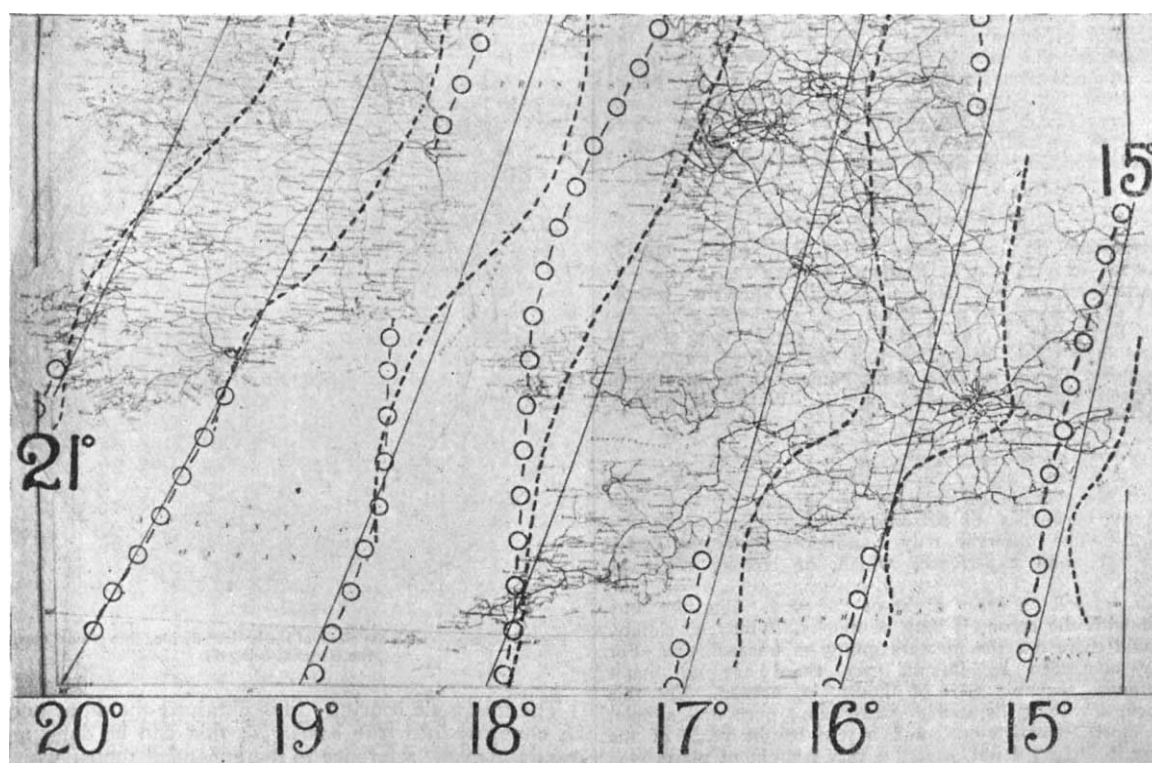


FIG. 10.—The western magnetic variation in S. Britain and in S. Ireland in 1907.

miralty. The full smoothed line shows the average position of the line of equal variation for 1907, the dotted line the variation obtained from land observa-

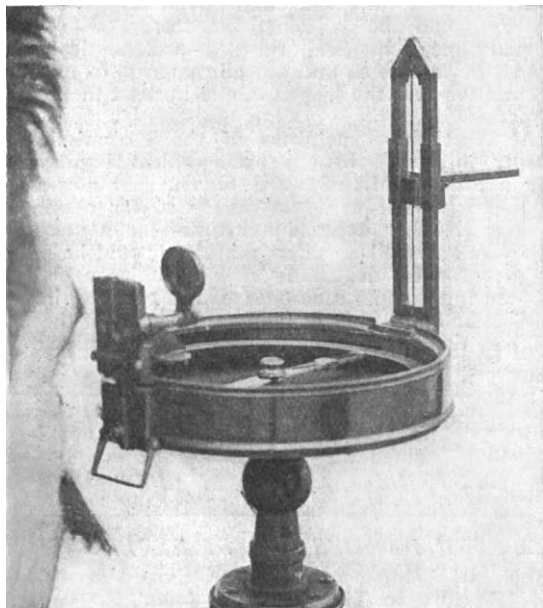


FIG. 11.—The prismatic compass, showing the sighting arrangement and manner of use.

tions alone, and the dot and circle line that got by observations at sea alone.

It will be seen that there is a strange divergence between the land and sea observations, but in spite of this the chart enables us to estimate the variation at any place on it within half a degree without astronomical observation.

I am glad to learn that the use of the mariner's compass pure and simple is now rapidly going out of use so far as archæologists are concerned, and for the rapid measurements of azimuths alone, using magnetic bearings, the azimuth, or prismatic, compass is the instrument generally employed.

It is cheap, light and handy. In the smaller instruments the needle is attached to the under surface of a compass card showing the thirty-two magnetic points. In the best forms a magnetised bar having an agate centre balanced on a steel pivot carries an aluminium or silver ring, which is graduated to half degrees, and with many monuments a greater accuracy than this is not possible. Its general arrangement will be gathered from Fig. 11. At one end of the box is a fine wire, at the other a right-angled prism; above the prism is a narrow slit, through which the wire is observed over the centre of the graduated ring. The prism reflects to the eye the graduation under

the slit, so that this, the wire, and the object observed are seen together. The graduation runs from 0° to 360° , the zero lying in the N. point of the magnetic meridian, so that the graduation read is the magnetic azimuth of the object seen through the slit in line with the wire.

In order to get a zero reading under the prism when we are looking magnetic north, the zero of graduation is at the magnetic south end of the needle.

The support of the fine wire also carries a hinged mirror, by means of which the azimuths of objects considerably above the horizontal line can be measured. For measuring the azimuth of the sun on the horizon, dark glasses are attached to the slit plate, which can be thrown into use when required.

When at work, when the box is rotated to bring any object in the line of the slit and wire produced, the needle, and with it the graduated ring, remains steady.

An ordinary level, furnished with a needle and card, can also be used for taking magnetic azimuths alone.

The 25-inch maps of the Ordnance Survey have put into the hands of archæologists a tremendous engine of research, from which true azimuths can be at once found without the intervention of a magnetic instrument in the field. To do this a *circular protractor* is employed in the manner shown in the accompanying figure.

In the case of the Avenue represented, a line some 12 inches long is drawn parallel to its length. Another line is then drawn parallel to the side of the map, which is always a N. and S. line, or very nearly so. The zero of the protractor is brought on the N.

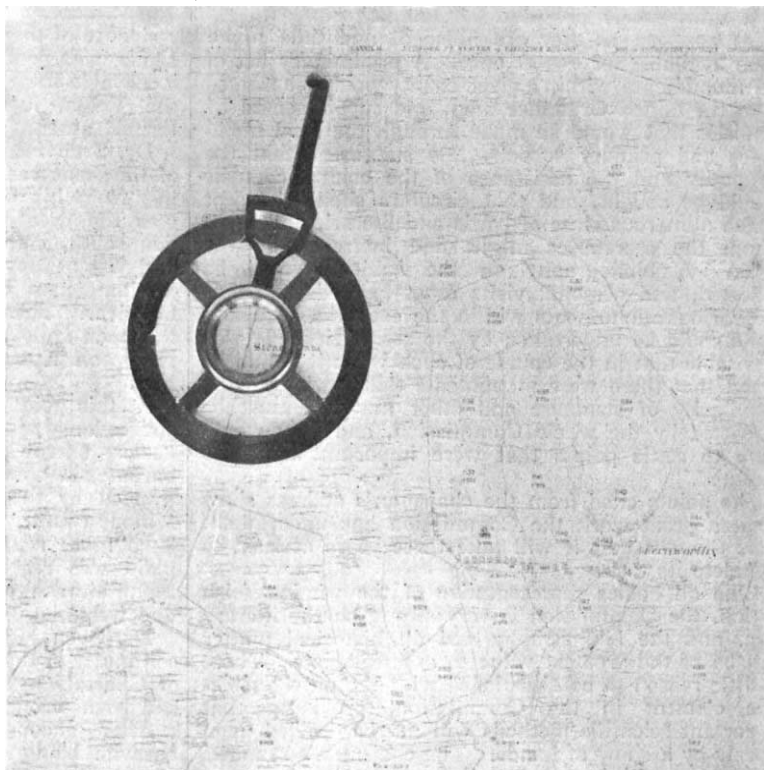


FIG. 12.—The circular protractor measuring the azimuths of an avenue on a 25-inch Ordnance Map of Dartmoor.

and S. line, and the centre on the point of intersection. The angle between the two lines is the azimuth.

NORMAN LOCKYER.